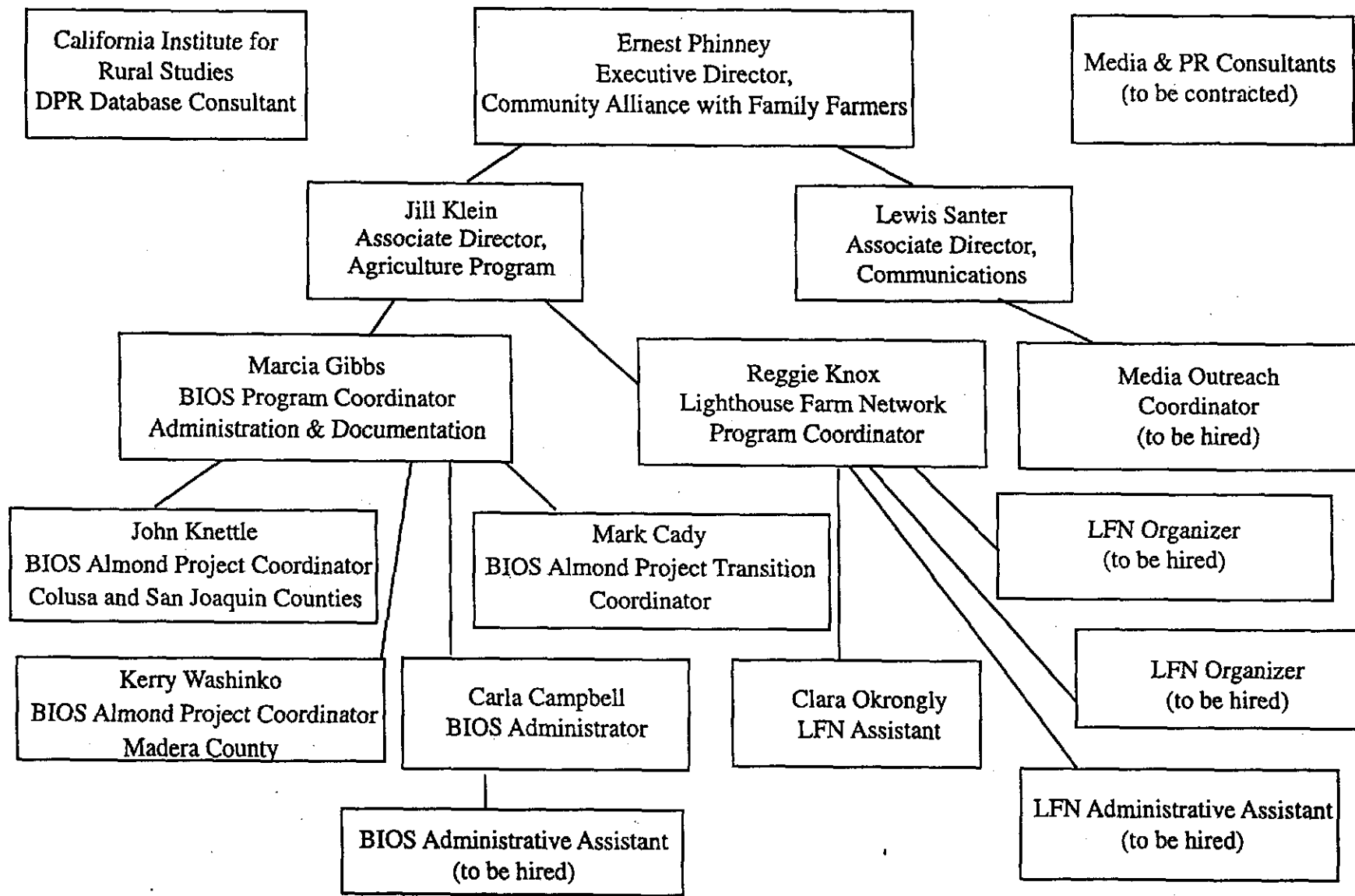


## CALFED Project Program Organizational Chart



## **Attachments**

Non-Discrimination Compliance Statement

*BIOS Update*

1996 Year End Almond Survey Analysis

BIOS Project Map

LFN Meetings Map

CIRS Letter

*Farmer to Farmer*

## NONDISCRIMINATION COMPLIANCE STATEMENT

COMPANY NAME

COMMUNITY ALLIANCE WITH FAMILY FARMERS

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), medical condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

## CERTIFICATION

*I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.*

OFFICIAL'S NAME

ERNEST PHINNEY

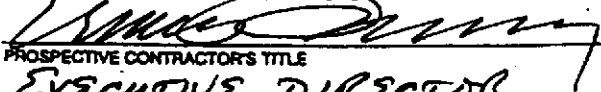
DATE EXECUTED

JULY 26, 1997

EXECUTED IN THE COUNTY OF

YOLO

PROSPECTIVE CONTRACTOR'S SIGNATURE



PROSPECTIVE CONTRACTOR'S TITLE

EXECUTIVE DIRECTOR

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

COMMUNITY ALLIANCE WITH FAMILY FARMERS FOUNDATION



# THE LIGHTHOUSE FARM NETWORK

The mission of CAFF's Lighthouse Farm Network is to build a community of farmers and other agricultural professionals who readily share information about farming systems which increase long-term profitability yet rely less on chemical inputs. Through a statewide network of monthly meetings and field days, the Lighthouse Farm Network provides technical information and support to all those interested in biologically-based farming practices.

We have established monthly meetings in fifteen regions around the state. Three essential components draw farmers to the Network:

## Technical Support

- ◆ Provide organized forums for farmer to farmer information sharing.
- ◆ Facilitate increased participation of research and extension with the Lighthouse Farm Network community.
- ◆ Provide support enabling farmers to develop long-term stewardship plans for their farm which include the interaction between people, land and economics.

## Community Building

- ◆ Continue to build an inclusive Lighthouse Farm community and social network.
- ◆ Increase access to and availability of products and services which benefit the Lighthouse Farm Network community.
- ◆ Work with CAFF programs to create linkages between farmers and ag professionals, organization and institutions.
- ◆ Clarify the importance of the role of policy in furthering the goals of the Lighthouse Farm Network.

## Public Outreach

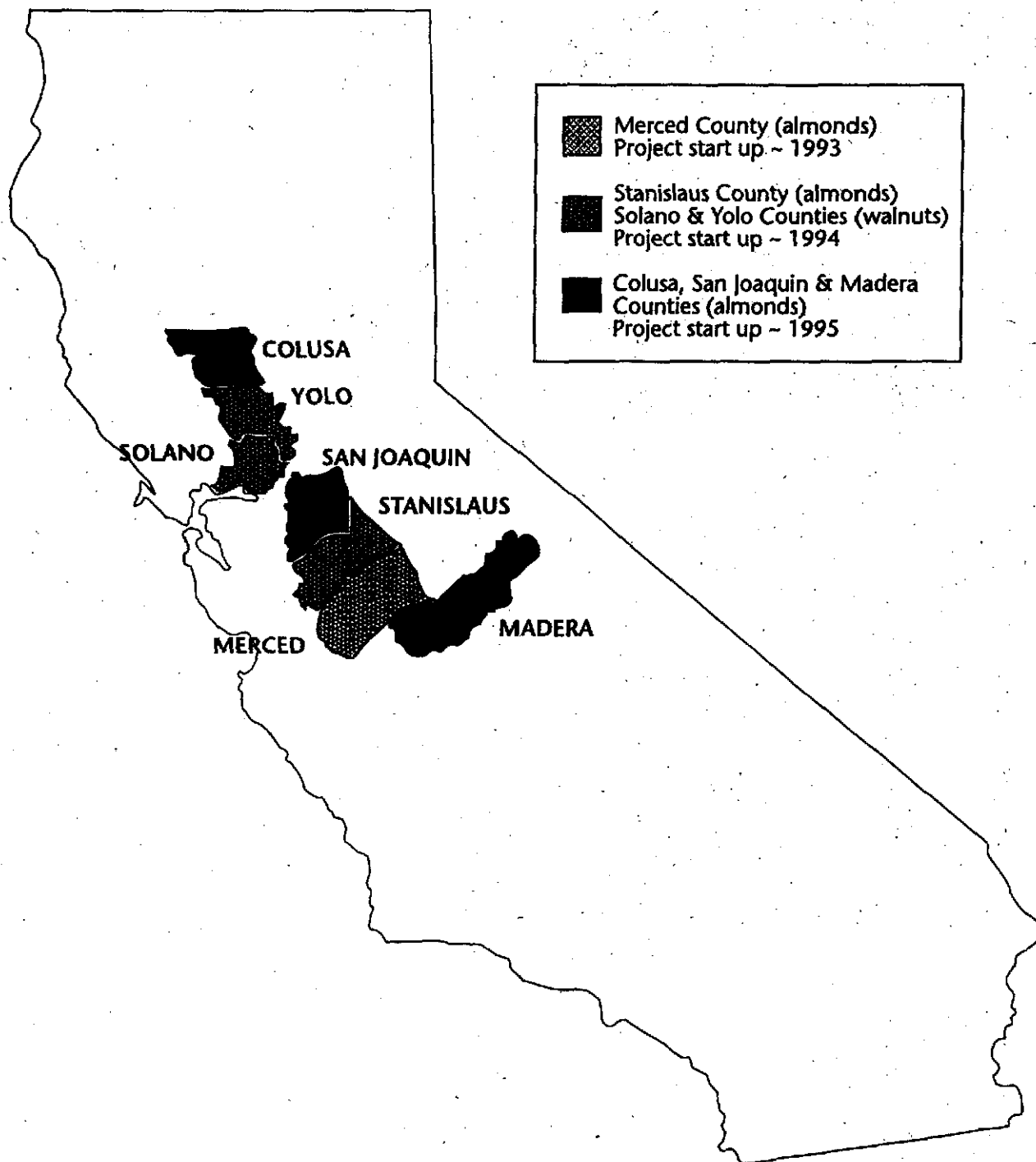
- ◆ Showcase successful and profitable farms that are part of the Lighthouse Farm Network, to a broad community of interests.
- ◆ Expand the Network to all important agricultural regions in California.


For more information on the Lighthouse Farm Network, contact Reggie Knox at 735 Chestnut Street, Santa Cruz 95060; phone: 408/457-1007; fax: 408/457-1003.

Community Alliance with Family Farmers PO Box 363 Davis, California 95617  
Phone: 916/756-8518 Fax: 916/756-7857 e-mail: [lfm@caff.org](mailto:lfm@caff.org) [www.caff.org](http://www.caff.org)

The Community Alliance with Family Farmers (CAFF) is a membership-based educational and advocacy nonprofit organization, with chapters throughout California. Our mission is to build a movement of rural and urban people who foster family-scale agriculture that cares for the land, sustains local economies and promotes social justice.

## **BIOLOGICALLY INTEGRATED ORCHARD SYSTEMS IN CALIFORNIA**





# **1996 Year End Almond Survey Analysis**

**Biologically Integrated Orchard Systems**

**A Project of the  
Community Alliance with Family Farmers**



**CAFF**  
P.O. Box 363, Davis, CA 95617  
916.756.8518

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## BIOLOGICALLY INTEGRATED ORCHARD SYSTEMS (BIOS) ALMOND PROGRAM

### EXECUTIVE SUMMARY

- In 1996, the BIOS Program had 72 enrolled walnut and almond growers in seven counties throughout the state. Together they farm more than 10,000 acres using BIOS management techniques.
- 90% of BIOS almond growers eliminated the use of insecticide dormant sprays.
- Overall use of organophosphate insecticides has decreased 71% since the beginning of the BIOS Program.
- Since joining the BIOS Program, over 75% of all growers have established a successful cover crop, 44% have released beneficial insects, and about 50% have reduced the amount of nitrogen applied to their orchards. 66% have seen an increase in wildlife in their orchards.
- Overall, BIOS growers have reduced the amount of nitrogen fertilizer, herbicides, and insecticide sprays they apply. Most importantly, 76% say they are pleased with the quality of the nuts and their economic returns.
- Results from the survey of BIOS growers shows that 85% of all BIOS almond growers use BIOS' field days, *Field Notes*, management team advice, and *BIOS for Almonds* to help them make pest management and fertility decisions.
- By communicating with other farmers and sharing on-farm innovations, BIOS participants are learning to farm in an environmentally friendly way. One BIOS grower remarked, "I'm learning to let nature do some of the work."
- Growers in the BIOS Program overwhelmingly agree that they would recommend the BIOS Program to other farmers or pest control advisors.
- BIOS information is reaching a growing audience. Over 750 farmers, pest control advisors, researchers and other almond industry professionals asked CAFF to put them on the BIOS mailing list this past year.





This report contains the results of the 1996 grower surveys and evaluations completed by enrolled growers in the BIOS Program. It includes a summary of the main management practices used by growers in the program, their satisfaction with these cultural practices, as well as grower comments regarding the program and its usefulness on their farms. Each year the BIOS Program model is updated and refined based on feedback from program participants.

## **B. SURVEY PURPOSE**

Enrolled growers in each of the five counties who participated in the 1996 growing season were asked to complete a survey questionnaire. This survey was designed to determine the progress, strengths, and weaknesses of the BIOS Program. Data was collected on acreage enrolled, management practices used, pest damage, the use of agricultural chemicals, crop yield, and information on project effectiveness.

When possible, comparisons were made with pre-BIOS grower practices, using information obtained from the BIOS enrollment forms. Along with the survey questionnaire, a program evaluation was mailed to each grower which solicited input about program elements and areas for improvement.

Of the 54 enrolled almond growers, 53 completed a survey, for a 98% response rate. The results of these two evaluation tools are included in the results sections which follow.

## **C. SURVEY METHODOLOGY**

A twelve-page grower survey questionnaire was prepared by CAFF staff (a copy is available upon request). This survey had several main categories:

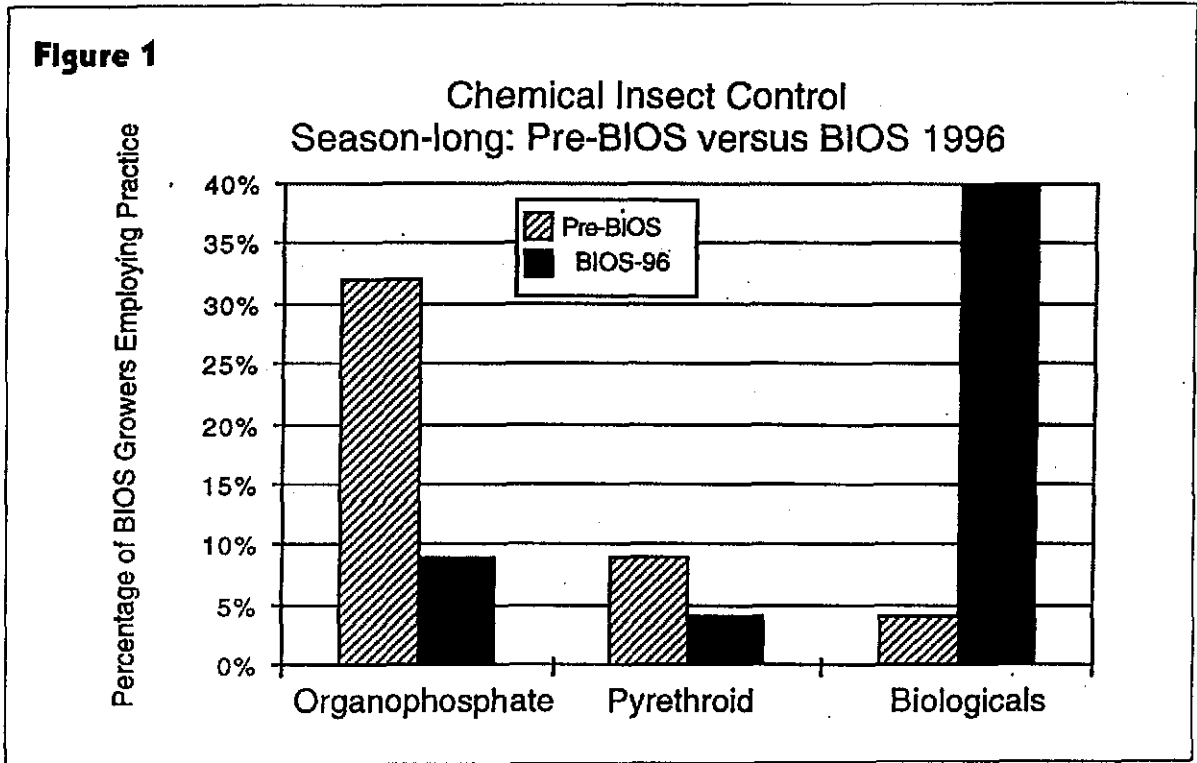
- use of cover crops
- pest control practices
- nitrogen applications
- management practices applied
- harvest/economic information

Each grower enrolled in the program for the 1996 growing season was interviewed via telephone, at which time the standardized survey questionnaire was completed.

It is important to note the difficulties inherent in this type of data collection. Many farmers do not keep day-to-day records on the timing of certain chemical applications. Many are applying less than the labeled rate, and some of the BIOS orchards are managed by farm managers other than the enrolled grower. It was sometimes difficult to obtain exact application rates of sprays or fertilizers. It is also difficult, in this report, to assess the total units of nitrogen applied because growers use many different types of fertilizers. Whenever possible, exact amounts of chemicals are recorded. In some cases we can identify a reduction, but not the exact amount of that reduction.

in the BIOS Program have eliminated the use of insecticide dormant sprays in their orchard. Ten percent used a pyrethroid, (Asana) or an organophosphate (Supracide).

Figure 1 compares pre-BIOS pesticide use to that under BIOS management. The figure shows a 71% reduction in the use of OPs since growers joined the BIOS Program. It also shows that BIOS growers have increased the use of biologicals by a magnitude of nine times from pre-BIOS levels.



## 2. Key Pests of Almonds

Numerous insects and mites inhabit almond orchards. Most cause little damage to the tree or nut crop. Some play a beneficial role in the orchard system by feeding on insect pests or other organic debris. Only a small fraction of species in an orchard cause economic damage to the crop. Of these, peach twig borer (PTB), navel orangeworm (NOW), San Jose scale, and webspinning mites (two-spotted and Pacific spider) have the greatest potential for economic impact on almonds in California. The information which follows on key almond pests was taken from the University of California publication, *Integrated Pest Management for Almonds* (1985).

orchards in Merced and Stanislaus Counties. One of the major finds of this study was the influence of winter sanitation in reducing the subsequent harvest infestation of navel orangeworm (NOW). "Those growers following recommended guidelines of fewer than two mummies per tree in February reduced NOW infestation by 48% over those that did not achieve this level," his report notes.

### Biological Control

Several parasitic wasps are currently being studied for their effectiveness in controlling NOW. These include *Goniozus legneri*, *Trichogramma* and *Pentalitomastix plethorica*. Forty-four percent of BIOS almond growers released *Goniozus* and/or *Trichogramma* for NOW control.

### Hull Split Sprays

It is at hull split that the threat of navel orangeworm (NOW) begins to mount. Hull split sprays are timed to correspond with NOW egg hatching as the hull begins to split on sound nuts in the tops of the trees. The hull does not need to be completely open to be considered split, just enough so that a visible opening is present. Using a hull split spray, such as the organophosphate Lorsban, at this time will provide a partially protective residue on the nuts. It is thought that spraying at hull split will suppress the early egg-laying period of the third generation and reduce the amount of damage on the unharvested nuts.

However, UC IPM research cautions that sprays for NOW can cause serious outbreaks of mites and destroy natural enemies of NOW and other insect pests. In Walt Bentley's comparison study, the level of NOW infestation at harvest crackout was statistically similar in the unsprayed BIOS orchards and in those that were conventionally managed. Only 11% of all BIOS almond growers applied a chemical hull split spray. The remaining 89% used no sprays or one to two applications of *Bts*.

### c. San Jose Scale

San Jose scale does not directly feed on the nut crop but damages the tree, causing yield reductions and eventually killing the tree. It feeds on plant juices and contributes to an overall decline in vigor, growth and productivity.

Conventional orchard systems apply an insecticide spray during dormancy to control or prevent flare-ups of San Jose scale. If a dormant spray is not applied, a spring spray during emergence can be used. PTB and San Jose scale cannot be controlled with the same dormant spray due to differences in both the spray material and the timing.

Most BIOS growers are finding that they can effectively eliminate the use of dormant sprays. However, this reduction does raise some concerns about an increase in San Jose scale in almonds.

UC IPM Regional Entomologist Walt Bentley found in his 1996 BIOS and comparison orchard study that the level of scale was low in both the sprayed orchards and unsprayed BIOS orchards. "What was unexpected," says Walt, "was the abundance of *Prospaltella* and *Aphytis* (two key San Jose scale parasitoids) in the BIOS orchards." He feels that these two parasitoids are having a dramatic impact on

have changed the type and amount of herbicide they are applying, using materials that are less persistent in the environment.

There are two main types of herbicides which can be applied to the entire orchard floor, tree row or to the area at the base of the tree. Pre-emergence herbicides applied in the fall or early winter kill weed seedlings as they germinate. The BIOS Program discourages the use of pre-emergence herbicides, which can pose problems in the environment since they can persist in soil for a few months to a year or more and leach into ground water. Simazine, a widely used pre-emergence herbicide and a known ground water contaminant, has been targeted by the US EPA for reduction in California.

The second type of herbicide is a post-emergence herbicide which kills the weeds on the soil surface on contact. BIOS encourages program participants to utilize the less persistent post-emergence herbicides (like Roundup and Goal) which do not remain in the soil for a long time. About 80% of BIOS growers rely on these two herbicides almost exclusively.

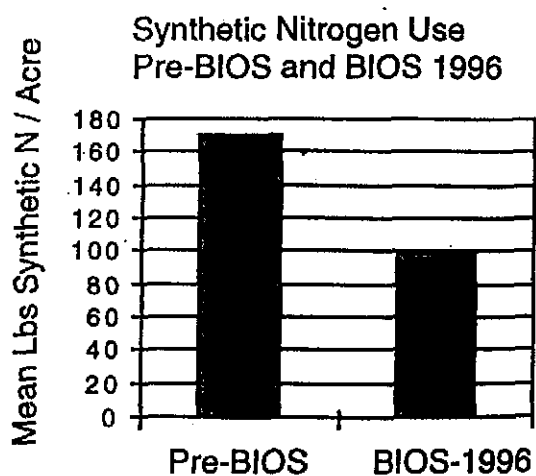
BIOS growers are reducing not only the use of pre-emergence herbicides, but are also greatly reducing the amounts of herbicides they apply. Rather than uniformly spraying the entire orchard floor, many are using a strip treatment of herbicide in the tree rows to prepare the floor for harvest. The 1996 survey asked growers if they had reduced the width of this treated strip since joining the BIOS Program. One-third of all growers have reduced the width of the strip they treat with herbicide and many indicate they use less herbicide at each application and still get a clean orchard floor at harvest.

## C. NITROGEN USE

Almond trees need adequate nitrogen for yield and growth to regenerate fruiting wood. However, current research indicates that excessive amounts of nitrogen may not benefit the orchard, but may actually cause increased disease pressure. Annual applications of large amounts of nitrogen are widely accepted, but not always justified. Nitrogen can leach from the soil and pollute ground water. Government regulation of nitrogen fertilizer to control excessive nitrates in the water is possible in the near future. The threat of nitrate contamination, coupled with the cost of nitrogen fertilizers, suggests that the best course of action is to increase the soil organic matter, not the amount or number of synthetic fertilizer applications.

BIOS growers are encouraged to make fertilization decisions based upon yearly leaf tissue analysis. Eighty percent of BIOS growers indicated they had a leaf tissue analysis done in 1996. This analysis, along with accounting for all other nitrogen sources such as cover crops or composting, can aid growers in dramatically reducing the amount of synthetic nitrogen they apply, as well as reducing the cost of their fertilizer program.

**Figure 2**



Still another method of irrigation scheduling is known as water budgeting, which makes use of crop evapotranspiration (ET<sub>o</sub>). Evapotranspiration is the sum of moisture escaping from the tree leaves and evaporating from soil. This measurement is useful in determining when and how much to water. Actual ET<sub>o</sub> is a measurement of the rate of evapotranspiration using temperature and humidity from close-cut grass. This is multiplied by a coefficient for almonds to assist with almond orchard irrigation scheduling. The Average ET<sub>o</sub> is the historical average daily ET<sub>o</sub> which has been compiled for locations throughout California.

Growers in the BIOS Program were asked how they made decisions about when and how much to irrigate for 1996. Figure 3 shows their responses to this question.

When asked if they had changed the number of times they irrigate or the total amount of water used throughout the season, 38% indicated they had increased their water use. Some had made changes due to better observation skills or were using updated practices and equipment to make this determination. Many growers noted that while they had increased the number of times they irrigated due to a cover crop, they also felt they used less water overall, indicating that the cover crop had helped the soil's ability to retain moisture.

**Figure 3**  
Irrigation Practices

Practice	Number of Growers Using Practice
Gypsum block readings	1
Tensiometer readings	15
Actual ET <sub>o</sub>	7
Average ET <sub>o</sub>	5
Check soil moisture with auger	20
Rotation schedule	9
Calendar	4
Visual	13

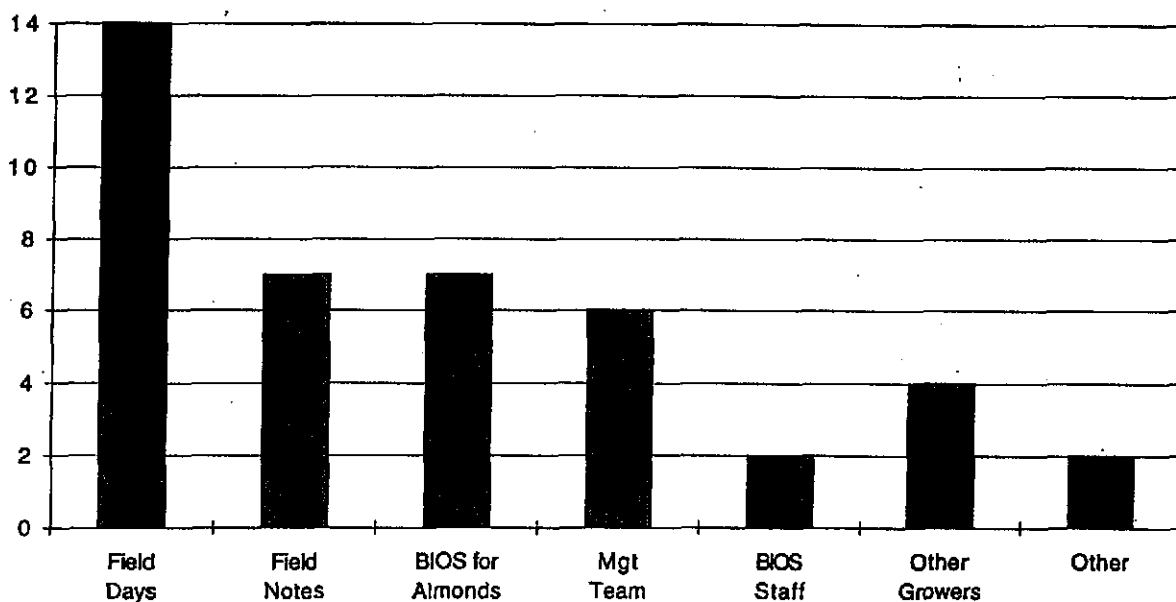
## E. YIELD /ECONOMICS

BIOS growers are finding that not only can they produce an economically viable crop, but they can do so by utilizing more biologically sound methods. In a recent study conducted by the Department of Agricultural & Resource Economics at UC Davis, "the economic viability of the BIOS practices was demonstrated" (Klonsky et al., 1996).

BIOS has been encouraging growers to look at the cost of chemical applications in terms of the economic return from the crop. BIOS growers may show more damage at harvest than conventional growers, but much less is spent on sprays and their application. Disease pressure may also be reduced by eliminating or reducing synthetic fertilizers. BIOS growers have been successful in adopting a "whole systems" approach which is supported by standard tools as well as some new ones. This approach is a healthy one which reduces the use of pesticides and synthetic nitrogen and lowers disease pressure over the long term.

Several of the enrolled growers commented on the usefulness of monitoring techniques. "I've learned more precise monitoring techniques for scale and mites," commented one grower. Another indicated that he now monitors weekly, and yet another said, "I'm in the orchard more and I've learned to look for beneficials as well as pests." These comments support the BIOS goal of educational forums and on-site technical assistance to help growers make informed decisions about their management options. Growers in the program are learning to make their decisions based on monitoring or knowing their own orchard rather than using the calendar approach.

**Figure 4**  
**Sources of Support**



## 2. BIOS Publications

BIOS *Field Notes* is a publication which comes out monthly during the active growing season. *Field Notes* provides current information about orchard conditions. One of its main purposes is to assist growers with orchard monitoring and pest management decision making. All growers who responded indicated that they read the *Field Notes* publication, usually within a few days of receiving it. The majority of growers responding to this question (70%) ranked the *Field Notes* as a 3 or above (useful to very useful). Most growers (75%) read them to find out what was happening in other BIOS growers' orchards. 60% of respondents stated they used the *Field Notes* for general information or to learn more about BIOS management practices.

The BIOS Update publication is the quarterly newsletter for the BIOS Program, providing updates for both the walnut and the almond projects. This publication was also widely read, with 100% of respondents indicating that they read it. Some read only the section on their geographic area, but most read the project summaries from all regions as well as the update section on overall program direction.

management team when he became concerned about the volume of biomass his cover crop had created. The management team member came to the orchard for a visit, and assured the grower that the cover crop was rich with diversity and would help out-compete less desirable weeds, add nitrogen and provide habitat for beneficial insects. He also explained that the cover crop was manageable and would allow the grower to have a clean floor at harvest. They discussed mowing strategies and mowing timing to ensure there would be no conflict at harvest. This meeting made the grower more comfortable about his orchard's conditions and grateful to the management team member for the support and information. BIOS will encourage management team members as well as BIOS Project Coordinators to stay in touch with program participants in 1997.

## **2. Continue to emphasize the economic effects of the BIOS Program.**

Farmers are interested in the bottom line. They want to know the economic impacts of the management decisions they make on their farms. BIOS will continue to support their management practices with sound economic data. There is UC research currently underway which is examining the cost effectiveness of BIOS practices versus more conventional ones. Documentation of economic information will be ongoing, and we will disseminate information to BIOS growers as information becomes available.

## **3. Continue to educate growers about the use of chemicals that are less disruptive and less polluting.**

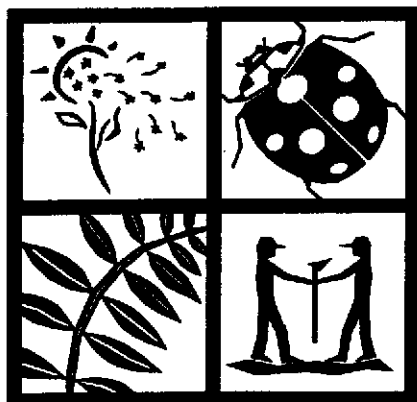
From the survey process, it became evident that growers need more information about the pesticide and herbicide choices they are making. Providing growers with information from DPR and the EPA will help growers distinguish which chemicals have the most potential to harm either the orchard beneficial population or the soil, air and water quality. We will develop a list of options or alternative practices.

## **4. BIOS growers want to know what is going on in other BIOS orchards.**

Farmer to farmer communication is one of the most important aspects of the BIOS Program. Keeping farmers connected to each other, satisfying their need for information, and helping them to share their orchard practices and results are key elements for the success of the BIOS Program. A continuing goal is to find effective ways to implement these ideas. Growers are a good source of ideas, and the BIOS Program will continue to expand its network of grower communications, meetings, and published materials, to help growers get the information they need. They will continue to share this information and seek support from agricultural researchers and businesses.

## **5. Providing more information on shredding (chipping) orchard prunings.**

An increasing number of growers are interested in information about shredding their orchard prunings. Many are afraid to shred due to warnings from their processor that shredding creates too much residue. Some processors will not accept nuts from orchards that have excessive shredded material. BIOS field days that have included information on shredding/chipping have been well attended and growers have indicated that learning about shredding, shredding equipment and other grower's chipping and shredding experiences are very important. BIOS will continue to present field days on shredding and make the most current information available to all interested growers.



# BIOS

Newsletter of the Biologically Integrated  
Orchard Systems Program  
A project of the  
Community Alliance with Family Farmers

Late Spring 1997  
Volume 6

*update*

## CAFF Showcases Walnut Orchards on Fourth Annual BIOS Farm Tour

On the 2nd of May, 70 people gathered together for a day-long tour of BIOS walnut orchards. Event participants included legislators, program funders and members of the press. Among the dignitaries attending the tour was local Assemblymember Helen Thompson. CAFF's Walnut BIOS Project is now in its third season, with 20 growers who have 500 acres of walnuts enrolled as demonstration sites in Yolo and Solano Counties. The goal of the tour was to showcase the BIOS program as a successful model for reducing the use of synthetic pesticides and fertilizers by promoting the adoption of a biologically based approach to farming.

Tour participants started the day at the orchard of Martin Mariani, who is part of the family-owned Mariani Nut Company in Winters. Martin explained that the multi-species cover crop in his BIOS block has helped with erosion control and water penetration, and has added organic matter and nutrients to the soil. He enrolled 15 acres in the BIOS program in 1994 because he was interested in exploring more "environmentally friendly" farming practices. He explained that recently some of his company's overseas buyers have shown great interest in products grown using a more biological approach.

At Craig McNamara's Sierra Orchards, also in Winters, Craig explained that he relies on his vetch cover crop to provide half the yearly nitrogen requirement in his conventionally farmed walnut orchards. Next, Mark and Dennis Mariani demonstrated a chipper that shredded a huge pile of orchard prunings in a matter of minutes. Mark Mariani explained that the chips would be transported and sold to a biomass plant in Woodland, where they would be converted to energy. When he mentioned a state assembly bill that would offer incentive payments to those who haul chipped orchard prunings, he was pleasantly surprised to find the author of the bill among the tour attendees. Also at this site some people took a closer look at the cover crop and its benefits with Management Team member Fred Thomas. Others learned more about biological pest control from UC IPM Entomologist Walt Bentley and from George Post of Agricultural Advisors Inc.

*(Continued on back page)*

### Welcomes and Farewells

Mike Spezia has moved on from his role as BIOS Program Coordinator. We thank him for his nearly two years of hard work and dedication to the BIOS Program. We wish him all the best in his future endeavors.

On April 28, Kerry Washinko joined the CAFF staff as the BIOS Almond Project Coordinator for Madera County. Kerry has worked with Central Valley growers for the past 12 years, most recently with valley vegetable growers as a Product Development Representative for Rogers Seed Co. Before this, she worked as a PCA for Bio Ag Services, releasing predatory and parasitic insects in orchards and vineyards. Kerry earned a B.S. degree in Agronomy from Colorado State University in 1981, and a M.P.S. degree in Agriculture from Cornell University in 1984. She is enthusiastic about her new position and is looking forward to meeting the BIOS participants in her territory.

Almond  
Merced, Stanislaus,  
Colusa, Madera, and  
San Joaquin Counties

Walnut  
Solano and Yolo  
Counties

### BIOS Staff

Jill Klein -  
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Almond Coordinator  
Ext: 20

John Kettle - Colusa  
San Joaquin Counties  
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Karminder Aulakh -  
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Marcia Gibbs - Research  
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Liza Lewis - Monitoring  
Information Coordinator  
Ext: 29

Deanna Simon -  
Walnut Field Scout  
Ext: 29

Carla Campbell - BIOS  
Program Administrator  
Ext: 15



## BIOS ALMOND PROJECTS

### Merced & Stanislaus Counties

*Mark Cady, Project Coordinator*

One of the basic ideas promoted by CAFF's BIOS program is soil building to promote healthy, resilient trees resistant to pests and disease. The idea is to work from the ground up to bring the system into balance for the long-term stability of nut production without over-reliance on agricultural chemicals. This view was reflected in the presentations at the January BIOS Soil Biology meeting at the UCCE office in Modesto.

Tom Yamashita of Sunburst Labs in Turlock presented data he has collected from many agricultural systems. Results indicate that crops grown on soils with reduced soil organic matter and microbial diversity are relatively prone to disease.

Kate Scow, UC Davis, described the organisms and the ecological relationships present in the soil as populations become more diverse and the soil food web becomes increasingly complex. These populations regulate the availability of nutrients and the physical condition of the soil. A diverse soil microbe population is dependent on the availability of organic matter such as cover crops, compost and brush chips.

In order to assure a long-term presence of BIOS in Merced County, the East Merced Resource Conservation District (RCD) has hired Christi Hansard to take on the coordination of the BIOS program. Members of the CAFF BIOS staff are serving as her mentors so that we can build a new kind of BIOS program that is locally run and meets the changing needs of agriculture. If you want more information, or would like to get involved, give Christi a call at (209) 723-3714.

### Colusa County

*John Knettle, Project Coordinator*

On March 10, BIOS grower Clay Shannon hosted a Compost, Cover Crops, and Beneficial Insect Releases Field Day in Arbuckle. Clay explained the benefits of the compost he applies to his orchards. Panel discussions with field day participants covered creating beneficial insect habitats, increasing earthworm activity, water infiltration, and cover crop maintenance. Finally, Roney Gutierrez gave an update on the Resource Conservation District Sand and Salt Creek Watershed Project.

Irrigation System Evaluation was the theme for the April 8 Field Day hosted by Gil Ramos. Presentations were made by Andy Geyer of Alsco and Mike Smith of Soils Solution Corporation. They were joined by local growers, UC Davis irrigation specialist Larry Schwankl, Resource Conservation District project manager Roney Gutierrez, and the BIOS Management Team in a discussion on irrigation systems for Colusa County orchards. Roney can be reached for EQIP cost-share information at the Colusa NRCS Field Office -telephone: (916)458-2931.

In May and June the BIOS Management Team is conducting visits to farms of enrolled growers as well as and growers interested in enrolling in the program.

Colusa county almond growers interested in learning more about BIOS can contact John Knettle at 756-8518 extension 20.

### San Joaquin County

*John Knettle, Project Coordinator*

The BIOS Management Team welcomes growers Quentin and Jean Wright, Charles Harris, Cliff Van Till, and Larry Woljen, who have recently enrolled in the San Joaquin BIOS project.

Thanks to Paul and Trish Tremayne of Ripon, for hosting the March 26 and April 22 Field Days. These events provided an opportunity for people to observe the Tremayne's cover crop at two different stages of maturity.

Spring Orchard Management was the theme at the March 26 Field Day. Steve Foidada, PCA and BIOS Management Team member, explained this year's BIOS field monitoring program. Steve Matthiasson, Four Seasons Ag Consulting, discussed pest monitoring in orchards. Almond grower and Stanislaus County BIOS Management Team member Ray Eck explained cover crop mowing strategies. Fred Thomas and grower John Lagier joined Ray in fielding visitor's questions on cover crops.

Other presentations were given by Terry Pritchard of UCCE on irrigation maintenance and scheduling, Tom Hoffman on owl boxes and gopher control, Cindy Lashbrook of Four Seasons Ag Consulting on insect identification and population management, and Fred Thomas on cover crop identification.

In May and June, the BIOS Management Team will be conducting orchard visits to enrolled growers. They will also visit with growers who are considering enrolling in the program.

### Madera County

*Kerry Washinko, Project Coordinator*

On April 28, the Management Team held a grower meeting for BIOS almond growers in Madera and Fresno Counties. We discussed what growers can expect from the BIOS program and, in turn, what the program expects from member growers. Suggestions were made to improve field days by shortening the length of the presentations and the overall length of the program. We also discussed different ways to communicate information between growers in the program.

A field day is scheduled for June 18. The meeting will be hosted by Fritz Helzer, S & J Farms, who will demonstrate cover crop mowing. Other anticipated topics include spider mites and beneficials, ant control options, fertility and tissue analysis, and a speaker from the local Resource Conservation District. Spring/summer farm visits to enrolled growers are scheduled for May 13 and 14.

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The mission of BIOS, a program of the Community Alliance with Family Farmers (CAFF), is to build a community of farmers, other agricultural professionals, and public institutions dedicated to the voluntary adoption of a whole systems approach to farm management that is flexible, maintains long term profitability, and relies less on chemical inputs.

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One of the objectives of the Madera BIOS program this year is to increase enrollment. We are hoping to recruit 10 new growers by cover crop planting time in the Fall. If you have any suggestions or contacts, please contact Kerry at (209) 227-3997.

## BIOS WALNUT PROJECT

*Karminder Aulakh, Project Coordinator*

Over 35 growers and PCAs attended the February Pest Management workshop, which featured presentations on walnut blight, alternative methods for control of codling moth, and presentation of the 1996 Year-End Monitoring report by CAFF's Liza Lewis. The highlight of the meeting was a discussion based on the experience of several BIOS growers who have released parasitic wasps and used pheromone confusion to control codling moth in their orchards. Meeting participants also purchased owl, kestrel and bluebird nest boxes built by the Esparto High School woodshop class.

In March the Management Team visited 18 out of 20 BIOS orchards to discuss cover crop mowing and management, fertility programs, and pest management strategies with growers and their PCAs. While several BIOS growers had excellent cover crops this Spring, most experienced disappointing stands compared to last year. Explanations for the poor performance of legumes ranged from slugs to flooded soils to poor germination. Thus, many of the visits focused on how to best manage the existing vegetative cover for benefits such as infiltration, summer weed suppression, organic matter, and habitat for beneficials.

In April, 25 enrolled growers, Management Team members, and CAFF staff toured Suchan Nursery in Lake County. Owner and walnut grower Alex Suchan shared a wealth of knowledge and experience with his visitors. He covered planting of seeds and seedlings, grafting, cover crop trials, mulching of leaves for weed control, the relationship between methyl bromide and crown gall, and more. About the only thing Alex didn't explain to the group was how to tell Paradox hybrid rootstock from California black walnut. For a copy of the notes from this tour, contact Karminder at the CAFF office. Also, see the article on Alex's approach to planting and grafting walnut seedlings in the May 1997 issue of *Pacific Nut Producer*.

The Fourth Annual BIOS Farm Tour, held on May 2, featured the BIOS Walnut Project for the first time. For an account of the tour, see page cover page.

## MONITORING

### Survey and Evaluation Data

*Marcia Gibbs, Research & Documentation Coordinator*

The 1996 year-end grower surveys are now completed with almost 100% returns. Many thanks to the growers for taking the time to complete this important survey. A full report on the survey and program evaluation results will be out in early June.

Thanks are also due to those BIOS growers who completed a program evaluation.

A preliminary analysis of the 1996 survey and evaluations shows that:

- 90% of all participating walnut growers applied no insecticides and had little insect damage at harvest. Insect damage averaged 2.2% in a harvest crackout conducted by BIOS before nuts went to the processors.
- Over 80% of BIOS walnut growers used the monitoring information provided by the BIOS Field Scout to help them make pest and fertility management decisions.
- Less than 10% of all BIOS almond growers used a dormant spray in the 1996 season and most growers have successfully eliminated the use of organophosphate sprays.
- About half of all BIOS almond growers have eliminated or reduced the use of herbicides since joining the BIOS program.
- 90% of all BIOS participants who completed a program evaluation felt they received the technical support they needed to implement BIOS practices. Field days were by far the biggest source of this support, with the *Field Notes* Publication and Management Team support following close behind.

### More on monitoring for the Spring

*Liza Lewis, Monitoring Information Coordinator*

In addition to the monitoring conducted by growers and PCA's, Steve Foiada from the San Joaquin County project has teamed up with CAFF to provide thorough weekly monitoring for the eight currently enrolled growers. These results will be published in the monthly *Field Notes* and summarized in a year-end report. Data from UC IPM Regional Entomologist Walt Bentley's specialized monitoring program in Merced and Stanislaus will also be included in these mailings. Walt is continuing his on-farm comparison study of BIOS and Non-BIOS blocks even though the Almond Board was unable to continue funding for 1997.

The value of standardized data collection pooled together from a group of orchards was evident in our comprehensive 1996 Monitoring Program Report recently completed for the walnut project. With a full-time walnut Field Scout, we provided participating growers with site specific information which helped them improve their pest, fertility and cover crop management. We also established baseline information on relative pest pressures for each orchard. The Walnut Field Scout continues to monitor all 20 enrolled orchards this season.

If you have questions or would like copies of *Field Notes* or the 1996 Monitoring Program Report or *Field Notes* please give Liza Lewis a call at : (916)756-8518 extension 29.

### BIOS for Almonds Guide Available

The guide is based on the experiences of growers, PCA's, and researchers. The cost is \$7.00 plus \$3.00 shipping (free to all enrolled BIOS growers and their PCA's). You can pick up a copy at BIOS field days, or call Carla at the CAFF office (916)756-8518 extension 15.





If you are not reading the BIOS Update and do not want to continue receiving it, please contact Carla at the CAFF office (916) 756-8518 and we'll take you off of our database.

**Almond Grower Recruitment:**  
The Management Team and CAFF staff are recruiting growers and PCAs for Colusa, Madera and San Joaquin counties. If you are interested in signing up or know of someone who would be a good candidate, please contact John Knette at (916) 756-8518. For Madera, please contact Kerry Washinko at (209) 227-3997.

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(Continued from front page)

The final stop of the day was Russell Lester's Dixon Ridge Farms, where lunch speakers discussed the adoption of BIOS-style practices for different crops in the state. Cliff Ohmart, Lodi-Woodbridge Winegrape Commission's Biologically Integrated Farming Systems (BIFS) Coordinator talked about the success of this project, which was funded through legislation introduced by CAFF. Jean-Mari Peltier, Department of Pesticide Regulations, described her agency's program, which funds similar projects in cotton, vines, and prunes.

A tour through Russ's organic walnut orchard highlighted cover crop mowing, compost spreading, use of remnant strips and insectary shrubs for beneficial insect habitat, a different method of brush chipping, and recycling of irrigation water through tailwater return ponds. Robert Bugg, UC SAREP, introduced the group to several species of earthworms found in the biologically active soils of Russ's orchard. Russ's daughter Jenny, a Winters High School junior, wrapped things up with a presentation of her F.A.R.M.S. project research on native grass plantings to attract beneficial insects. F.A.R.M.S. is a collaborative project that brings high school students from five counties to Sierra Orchards to learn hands-on about agriculture and science.

This project has been funded in part by the United States Environmental Protection Agency Assistance Agreement No. C999026-99-6 to the State Water Resources Control Board and by Contract No. 5-483-333-9 to the University of California. The contents of this document do not necessarily reflect the views and policies of the Environmental Protection Agency of the State Water Resources Control Board nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

## UPCOMING ALMOND EVENTS

**Colusa County: Wednesday, May 28, 9 - 1 pm, 6766 Harrington Road.** Topics: Improving cover crop habitat to promote beneficial insects, rainfall simulation tests for ground cover and water infiltration, mowing, cover crop regeneration, insect identification.

Contact John Knette (916) 756-8518 for more information.

**San Joaquin County: Tuesday, June 1, 8:30-11:30 am, Ripon Firehouse.** Topics: Spray timing, Dipel for PTB, *Goniozus*, floor management.

Contact John Knette (916) 756-8518 for more information.

**Colusa County: Tuesday, June 17, 9 am-1 pm, location and topics TBA.**

Contact John Knette (916) 756-8518 for more information.

**Madera County: Wednesday, June 18, 9-Noon, S & J Ranch, 9151 S. Minturn Road, Chowchilla.** Topics: Spider mites, fertility and tissue analysis, ant control, cover crop mowing demonstration. Contact Kerry Washinko (209) 227-3997 for more information.

**San Joaquin County: Wednesday, July 13, location and time TBA.** Contact John Knette (916) 756-8518 for more information.

## UPCOMING WALNUT EVENTS

**Yolo & Solano Counties: Wednesday, June 4, 8:30 - 11:30 am, call for directions.** Topics: biological control of mites, beneficial insects in hedgerows, cover crops, and insect identification. Contact Karminder Aulakh (916) 756-8518 for more information.



## THE CALIFORNIA INSTITUTE FOR RURAL STUDIES

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July 24, 1997

TO: Marcia Gibbs  
Jill Klein  
CAFF

FROM: Don Villarejo

RE: CALFED Proposal

Here are our thoughts on costs for the work and costs to track reported pesticide use data for the CAFF BIOS almond project. It is based on current costs for purchasing data files and our staff time for updating, supervision and data analysis. The counties to be included are: Colusa, Madera, Merced, San Joaquin and Stanislaus. The total number of growers is estimated to be 90, based on your estimate of 40 for the Colusa, Madera and San Joaquin program, and 51 for the Merced and Stanislaus program.

CIRS will prepare a written narrative report on pesticide use in blocks of almond orchards, as specified by CAFF staff, including, but not limited to, diazanon, supracide and organophosphates. The annual total cost is:

Total Cost	\$32,000
Total hours	842
Hourly rate	\$38

The time-line for completion of each phase of the project depends upon the availability of public record pesticide use report (PUR) data provided by the individual counties. 1996 PUR data was made available by the majority of the counties of interest on May 1, 1997. Under the assumption that a similar time frame would apply each year, then the proposed CIRS time-line would be, for 1998 (and corresponding dates for subsequent years):

January - March 1998, update 1997 county permit records  
May - July 1998, update 1997 PURs

**Budget justification***County updates*Staff time

Executive Director

25% for three months @ \$40,000 FTE \$2,500

Research Associate

12 weeks on full-time @ \$29,250 FTE 7,312

Computer Consultant

25 hrs @ \$36/hr. 900

Fringe benefits, 20.48% of Salaries 2,914

Data Purchase

Five counties - CS, MA, MC, SJ, ST 800

*Pesticide Use Reports*Staff time

Executive Director

33% for three months @ \$40,000 \$3,300

Computer Consultant

180 hrs. @ \$36 per hour \$6,480

Fringe benefits, 20.48% of salaries 2,003

Data Purchase

Annual pesticide use report data files (6 counties) 1,040

D-M Information Systems

Data Conversion 540

Sub-total, direct costs \$27,250

Indirect costs, 17.5% of Direct Costs 4,750

Total project costs \$32,000